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4 ECOLOGICAL AND OTHER FACTORS IN THE RISE AND FALL  
OF THE ZIMBABWE STATE

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Great Zimbabwe lies in a favoured ecological zone at the western end of an escarpment that runs from just south east of Nyanda/Masvingo to the Bikita Highlands in the east. This escarpment is the dividing line between the highveld plateau of central Zimbabwe and the middleveld of the 'Zaka Plain' the altitude dropping from the region of 1 100 m above sea level on and to the north of the escarpment to under 900 m below it. The mean annual rainfall on this escarpment varies between 800 and 1 000 mm per annum of which up to fifteen percent can fall within the dry months between April and September.(1) According to Vincent and Thomas the majority of the escarpment lies within an ecological zone designated as Natural Region IIB, that is an area which though subject to moderately dry spells in the summer, is not excluded from intensive systems of farming based primarily on crop production.(2) More recently the then Department of Conservation have produced a new Natural Regions Map where the whole of the escarpment has been placed in Natural Region III because of the effects of the mid season drought in the region. The data for the compilation of this map was compiled from rainy pentads, that is the centre of one of 35-day periods (pentads) which together receive more than 40 millimetres of rainfall, two of which receive at least 8 millimetres of rainfall. (3) as opposed to Vincent and Thomas who relied more on natural vegetation for their interpretation of Natural Regions. The most recent study of the climate of the escarpment was by Bromley and Lang, who divided the escarpment into; the Northern Hill slopes [south east facing] and the Bikita/Mdanga/Morgenster plateau. The former was described as being well watered and having a climate similar to the Eastern Districts but having little arable land due to the topography of the zone; the latter was described as being well watered with rainfall persisting well into April or May and whilst late starts to the rainy season and mid season droughts may occur the effect on them would be less severe than in the surrounding lower areas. Winter cropping would also be possible where water was present and frost not too severe.(4) The general impression that one gets of the escarpment is that it is a well watered island surrounded by comparatively drier country and that much of its excess rain is orographic in nature and caused by moist laden south east winds, guti, hitting the escarpment even when the Inter Tropical Convergence Zone does not bring the main rains to this latitude.(5)

Bantu-speaking agriculturalists have occupied the region and practiced mixed farming for at least 1 600 years and their activities must have had a considerable effect on the vegetation climax of the escarpment.(6) At the present time the natural vegetation is generally Brachystegia/Julbernardia or miombo woodland (musasa and munondo), though, due to the high rainfall, other tree species such as Uapaca kirkiana (mushuku or muzhanje) and Albizia adianthifolia (mucherenje) often occur. In certain areas, either due to fire or farming activities, a sub-climax grassland with Hyparrhenia species are dominant, especially on the plateau behind the scarp. In other areas there are also relic patches of moist broadleaved montane forest, similar to those found in the Eastern Highlands, and which may have been more extensive before the establishment of a man induced ecosystem.(7) The grazing on the escarpment is generally sour veld, as is much of the middleveld that lies to the south east of the escarpment — the exceptions being that portion of middleveld that lies to the west and south west of Great Zimbabwe in the Tokwe Mushandike area, which is sweetveld, and an area stretching from about the vicinity of the town of Nyanda to Glendara which consists of Acacia woodland and is mixed to sweetveld.(8)

Several hypotheses have been advanced in the last ten years or so to explain the rise of Great Zimbabwe in relationship to its position. They are concerned with the relationship of Great Zimbabwe with long distance trade routes, local gold production and the position of Great Zimbabwe and the seasonal movement of cattle herds from it towards the tsetse fly country in the lowveld. These various hypotheses will now be examined.

Huffman was of the opinion that 'The gold trade was directly responsible for the rise of the Zimbabwe State...(9)'. Whilst gold and its trade may have been contributory factors, if not in the rise, at least in consolidation of the power of the state, they do not explain why the original site of Zimbabwe was chosen. As has often been pointed out, Great Zimbabwe itself is not on an actual gold field. The Victoria gold field lies some ten kilometres to the west, but, as Phimister has pointed out, the existing evidence of this gold field being worked extensively during the pre-colonial period is scanty. He points out that in fact gold production was probably more important and may have been connected with Great Zimbabwe in the alluvial and eluvial 'placer' deposits in the Fern Spruit and Tokwe Valley area. These fields were worked by Later Iron Age people and may have had some connection with the rise of Great Zimbabwe.(10) More recently a pre-colonial gold field has been reported near Renco Mine in the Nyajena Communal Farming Area some thirtyfive kilometres to the south of Great Zimbabwe. However, until this is investigated by archaeologists any link that it might have with Great Zimbabwe must be tentative. It is of interest that in the vicinity of this goldfield there are a large number of *Bocassus* palms -- one of the few places they are found in Zimbabwe.

There has been a tendency for writers on Great Zimbabwe to explain its rise, and indeed fall, in terms of mono-causal theories, which was recognised by Garlake, who pointed out that the economy of Great Zimbabwe was integrated with farming, cattle herding as well as with the trading and mining activities that were carried out.(12) Garlake recognised the importance of Great Zimbabwe's position, and also the position of other Zimbabwe sites in Mocim-bique and Zimbabwe, in relation to a system of transhumance pastoralism, which in Zimbabwe was often based on the edge of the plateau and from which cattle were herded towards the lowveld and the seasonally fluctuating fringes of the area of tsetse infestation. He suggests that the siting of these zimbabwe sites was determined by the demands of a similar system of transhumance /to that which existed at Great Zimbabwe/(12). It should be pointed out, however, that Great Zimbabwe would appear to pre-date the founding of the majority of other zimbabwe sites by members of the Zimbabwe culture by about one or two centuries.(13) It has already been pointed out that the whole of the escarpment lies within an ecological region and it is now relevant to compare Great Zimbabwe with other parts of the escarpment which lie to the east. The copper mines of Mukondo were worked in pre-colonial times and copper, we know, was traded with the feira of Manica; these mines are within sixty kilo metres distance of the Bikita Gap and within forty of the Chibvumani zimbabwe which lies at the eastern extremity of the escarpment.(14) However, as Mtshwa pointed out, iron was often scarce in Duma until the Njanja began to exploit the iron deposits around Nyuni hill in the eighteenth century, though, he points out that iron was available in Charumbira's country, i.e. around Great Zimbabwe.(15)

Another important consideration affecting the area around Great Zimbabwe is that it appears to be the only area on the escarpment where both sour, sweet and mixed veld are found in large areas of close proximity. The sour veld lies around Great Zimbabwe itself and stretches eastwards towards Bikita and includes much of the country classified as middleveld below the scarp. The sweet veld lies in the dry country to the south west and west of Zimbabwe

and starts within ten kilometres of Great Zimbabwe. There is a marked climate change in a distance that is little more than two hours walk. This is in the Tokwe and lower Mwashandike vallies, which break the western end of the Zimbabwe Bikita escarpment and turn it into an escarpment with a north-north west to south-south east axis in turn causing a rainshadow. From Nyanda running along the northern extremity of the Beza Range there is a belt of Acacia Savana which can be classed as mixed to sweetveld. This belt of country extends eastwards towards Glen Clova(16) (see Map) Guy(17) has shown the importance of climate, ecology and grazing types on the history of Zululand with special reference to the rise of the major pre-Shakan Chiefdoms and later mfecane. He pointed out that often major chiefdoms had their origins in areas where a particular configuration of vegetational types existed, namely sweetveld, sourveld and mixed veld. He pointed out that this was unusual in South Africa but not so in Zululand where rivers had cut deep valleys out of the surrounding country. Within these valleys there was a rain shadow and low altitude which resulted in sweetveld, but unlike the remainder of the drier parts of southern Africa the rivers provided water for stock and both sourveld and mixed veld were in fairly close proximity to the sweetveld areas of the valleys. Guy goes on to suggest although the physical environment of Zululand was particularly well suited to the activities of stock farming cultivators the system was breaking down under pre-Shakan modes of production due to competition for declining resources which led to famine, and subsequently the rise of the Zulu Kingdom under Shaka. There are obvious ecological similarities between Zululand and the region around Great Zimbabwe.(18)

The presence of different ecological zones around Great Zimbabwe may well have been an important factor in the rise of the Zimbabwe State, though it must be atressed not the only factor, the others being favourable climate at Great Zimbabwe itself, the nearness of iron deposits, the availability of building materials, the proximity of the alluvial gold fields on the Tokwe, Fern Spruit and possibly Nyajena and the control of long distance trade routes, though the latter may have been a later development once Great Zimbabwe had already become an important centre.(19)

The Montevideo Ranch site excavated by Robinson and Sinclair shows connections with the Zimbabwe Culture over a long period (Zimbabwe periods II to IV as defined by Robinson) and the faunal remains recovered by Sinclair were largely those of domestic stock, in turn the majority of which were Sanga cattle.(20) This would tend to confirm that there was a close relationship between the people who lived in the sweet veld of the Tokwe Valley and the people of Great Zimbabwe and that transhumance may have practised over shorter distances than Garlake thought, at least in the case of Great Zimbabwe.(21) Various hypotheses have also been put forward regarding the decline of Great Zimbabwe, which has been approximately dated to sometime in the fifteenth century, after which it ceased to be a major centre.(22) It has been established that the Khami Culture was the successor to Great Zimbabwe and that the expansion of the Zimbabwe Culture itself took place at either about the same time or within the last period that the state existed and may well have had some connection with the fall of the Zimbabwe state. The main current theories regarding the fall of Great Zimbabwe postulate either there was; an ecological collapse in the environs of Great Zimbabwe due to the large population and diminishing resources, the tapping of the trade routes that were controlled by Great Zimbabwe by the Ingombe Ilede people of the Central Zambezi and civil unrest in the state which in turn may have been caused by declining resources.(23) At the present time we do not know the exact reason though once again the present writer thinks that it may be an interplay between all three factors.

It has been established that Great Zimbabwe had developed into a considerable urban centre before its fall. It had a population of up to 11 000 people and covered an area of just under a square kilometre. (24) The number of these people who were involved in agriculture or herding is uncertain but a large majority of them must have been involved in one way or another and it is useful to compare the present population densities in the Mtilikwe and Victoria Communal Areas as they are by present standards considered to be excessive; they are a mere sixty to sixty nine people per square kilometre. (25) Of course the population in these communal areas is not urban and many of the people who lived at Great Zimbabwe may have walked many kilometres to their fields and a transhumance grazing pattern has been suggested. Nevertheless, the population pressure on Great Zimbabwe's resources must have been disastrous in the long term, vegetation cover must have been more or less entirely removed by the needs of firewood alone, let alone grazing or other uses, water resources would also have dried up once the vegetation cover had been removed and soil erosion may have been a serious problem, though its effects are not particularly noticeable today and the nineteenth century Duma of Mugabe were able to cultivate the land around Great Zimbabwe. (26)

Huffman has demonstrated on a map of Great Zimbabwe and its environs the area that was built up with pole and waga huts outside the ruins area. (27) It has already been pointed out that the most common type of vegetation in the Zimbabwe region is Brachystegia/Julbernardia or miombo woodland, consisting of Brachystegia speciformis (musasa), Brachystegia glaucescens (muunze or mountain acacia) on kopjes and Julbernardia globiflora (munondo); these species do not occur within the immediate environs of Great Zimbabwe in an area more or less corresponding to Huffman's built up area, though they all occur just outside it. There is no change in soil types between the immediate environs of Great Zimbabwe and the outer area where Brachystegia/Julbernardia woodland occurs; both are on granite derived soils. Brachystegia and Julbernardia species are normally copious coppicers and as farmers can testify, will start coppicing in lands that have been cultivated for a long period. It follows from the foregoing discussion that there would appear to be some correlation between the absence of Brachystegia and Julbernardia in the area of Great Zimbabwe that was built up and that its absence may be due to the effects of a prolonged removal of the vegetation from the soil and the effects of continued habitation on that area over a considerable time. (28) In Appendix One a list of the woody vegetation in the immediate environs of Great Zimbabwe is supplied and it should be noticed that some of these can be classed as pioneers, for example, Celtis africana, Trema orientalis and Bridelia micrantha amongst others. (29)

Photographs and drawings of Zimbabwe in the late nineteenth and early twentieth century show, that with the exception of the Great Enclosure, the area is generally much less wooded than it is today, and this would appear to be the result of the land being used by Mugabe and Nemanwa's people for cultivation. This amount of cultivation should not, however, have impaired the re-growth of Brachystegia/Julbernardia. (30)

Mtsetwa has shown that there was a protracted war between Mugabe's and Nemanwa's peoples in the nineteenth century which was basically fought over the land around Great Zimbabwe, which was becoming scarce due to relative population pressure in the region. (31) With the population pressure being what it was just prior to the fall of the Zimbabwe state the severity of armed conflict could have been considerably greater and may well have been one of the reasons for the wide spread diaspora of the peoples of the Zimbabwe Culture to points as far apart as northern Mashonaland and southern Mocambique, and possibly even further. (32)

## SUMMARY AND CONCLUSIONS.

In the past mono-causal hypotheses have sometimes been advanced to explain the rise and fall of Great Zimbabwe and the Zimbabwe state. It is more likely that the state arose from a combination of causes and that at different stages in the chronology of the rise of Great Zimbabwe certain factors were more important and other stages different factors should be taken note of. As in the case of most important historical sites Zimbabwe was chosen before it became important; its favourable climate and proximity to goldfields may have assisted its initial growth, as would the existence of sweet veld and sour veld in close proximity. In time the area in which Zimbabwe was able to expand its transhumance economy may have increased as probably did its ability to tap the long distance trade routes from the Leopards Kopje area to the sea. However, no one of these causes by itself can explain the rise of the Zimbabwe state and there is a great need for much more interdisciplinary research into the various factors connected with the rise of the Zimbabwe state, especially in relationship of Great Zimbabwe to the climate and ecology, the economy of the state and its relationship with the economies of other polities in South East Africa.

The fall of Great Zimbabwe would appear to be related to a breakdown in the man-induced ecosystem of the area around Great Zimbabwe; this was probably coupled with civil war between various factions of the dynasty that controlled the state and may have also been associated with the loss of or competition for the control of long distance trade routes. The vegetation in the immediate surrounds of Great Zimbabwe is slightly different from that of the surrounding country for no apparent reason, the main difference being an absence of Brachystegia Julbernardia woodland and the presence of certain 'pioneer' species. This may be connected with the ecological succession of vegetation after the area was completely denuded of vegetation at some stage in the past. Further research is required to ascertain the nature of the vegetation succession in the area around Great Zimbabwe.



# REFERENCES.

1. K. Bromley and M. Lang, Report on the Climate of I R D A 1. Departments of Research and Specialist Services and of Meteorological Services, Harare, 1980.
2. V. Vincent and R.C. Thomas, An Agricultural Survey of Southern Rhodesia: Part One: Agro-Ecological Survey, Federal Government Printer, Salisbury, 1960, p 55 and Map of Agro-Ecological Regions enclosed.
3. Department of Conservation and Extension: Map 1: 1 000 000, Natural Regions and Related Farming Systems, Salisbury, 1980.
4. Bromley and Lang, Report on the Climate of I R D A 1.
5. Personal observation by writer who lived at or near Great Zimbabwe for about four years. When guti conditions caused considerable rain around Great Zimbabwe it was often completely dry at Nyanda. One only has to compare the vegetation around Great Zimbabwe to that at Nyanda and below the escarpment to realise the considerable difference in rainfall.
6. Early Iron Age pottery has been found at Great Zimbabwe and there are other E.I.A. sites in the south and east of Zimbabwe from about the 3rd century A.D. See K.R. Robinson, R. Summers and A. Whitty, Zimbabwe Excavation 1958, National Museums of Southern Rhodesia, Salisbury, 1961, pg. 236; and P.S. Garlake, Great Zimbabwe, London, Thames and Hudson, 1973, p 102.
7. For a description of the woody vegetation of Zimbabwe see H. Wild and Fernandes Flora Zambesiaca Supplement: Vegetation Map of the Flora Zambesiaca Area, Published on behalf of the Governments of Portugal, Malawi, Zambia, Rhodesia and the United Kingdom by M.O. Collins, Salisbury, 1968, and Vincent and Thomas, Agricultural Survey. Also my own personal observations in both the Zimbabwe and Eastern Highlands areas.
8. Briefly Sour veld comprises those grasses that become unpalatable to stock when they are mature and are found normally on the wetter and higher areas; Sweet veld consists of those grasses which are normally palatable throughout the year and are more usual in the lowveld and are often annuals as opposed to perennial grasses and Mixed veld is a combination of both types. This is in its most simple form for a brief description of common grasses found in Zimbabwe; see C. Lightfoot, Common Veld Grasses of Rhodesia, Natural Resources Board, Salisbury, 1970 pp 2-3.
9. T.N. Huffman, 'Ancient Mining and Zimbabwe', Journal of the South African Institute of Mining and Metallurgy, Jan., 1974, pp 238-42.
10. I.R. Phimister, 'Ancient Mining Near Great Zimbabwe', Journal of the South African Institute of Mining and Metallurgy, Jan., 1974, pp 233-7.
11. R. Summers, Ancient Mining in Rhodesia and Adjacent Areas, Museum Memoir No. 3, National Museums of Rhodesia, Salisbury, 1969, ps 79, 152 and 155. This does not appear to have been followed up by anyone regarding its possible connection with Great Zimbabwe from which the gold field lies some 45 kilometres direct to the south east. Recent reports indicate that there are fairly extensive old workings in the vicinity of and at the present Renco mine for which see The Mail, Salisbury, November 22nd, 1981. The modern mine is alleged to be one of the richest in Zimbabwe. The old works at the mine are large and were partially used to open up the new mine in its early days; personal oral communication M. Froude. The question of Borassus palms near Renco is also of interest. Botanists appear to be unhappy about their exact natural distribution, Coates Palgrave, The Trees of Southern Africa, Struik, Cape Town, 1977, is of the opinion that their distribution

- is acceptable (*Borassus aethiopum*) see p 69. It is not unusual for palms to be found in isolated clusters at the limits of their range, the nearest other cluster is in the Lusitu Valley on the Mocambique border north of Chipinge; oral communication, Tom Muller, National Botanical Garden, Harare.
12. P.S. Garlake, 'Pastoralism and Zimbabwe', J.A.H., XIX, 4 (1978) p 479-93.
  13. T.N. Huffman, 'Appendix 1: Radio Carbon Dates', in D.N. Beach, The Shona and Zimbabwe, Mambo Press, Gwelo, 1980, ps 324-5. Of course this is not conclusive and Chipadzi does date back to the 1300s.
  14. I.C. Pereira, 'Lappas das Minas Conhecidas no Districto de Senna', 30th July, 1857, Memória e Documentos reports of copper mining in eastern Duma; R.G.M. Mtetwa, 'The "Political" and Economic History of the Duma People of South-Eastern Rhodesia from the Early Eighteenth Century to 1945', Unpublished D.Phil. Thesis, University of Rhodesia, 1976, p 268; R. Summers, Ancient Mining, dates Mukondo to the 16th and 17th centuries at least.
  15. Mtetwa, 'The Political and Economic History', 268-9, though he points out iron was also obtained from Nyuni from the 18th century and Njanja and Wedza.
  16. Personal observations and see also, Wild and Fernandes, Flora Zambesiaca Map.
  17. J. Guy, 'Ecological Factors and the Rise of Shaka and of the Zulu Kingdom', in (eds) S. Marks and A. Atmore, Economy and Society in Pre-Industrial South Africa, London, Longmans, 1980. 102-19.
  18. Ibid., p 117.
  - 19.
  20. P. Sinclair, 'First Steps towards the Reconstruction of the Rural Economy of the Zimbabwe State', Roma Conference Paper, 1977.
  21. Garlake, 'Pastoralism and Zimbabwe', Sinclair, First Steps.
  22. T.N. Huffman, 'The Rise and Fall of Zimbabwe', J.A.H., XIII, 3 (1972) pp 353-66, Garlake, Great Zimbabwe, ps 110 and 198-9; D.N. Beach, The Shona and Zimbabwe, Gweru, Mambo 1980, pp 50-1.
  23. Beach, The Shona and Zimbabwe, 36-51; Huffman, 'The Rise and Fall', P.S. Garlake, 'Rhodesian Ruins — A preliminary Assessment of Their Style and Chronology', J.A.H. (1970) XI, 499-500½
  24. T.N. Huffman, 'Zimbabwe: Southern Africa's First Town', Rhodesian Prehistory (1977) VII, xv, 9-14. The area on the map that is built up is about one kilometre.<sup>2</sup>
  25. Statistics compiled by Department of Agricultural Development, 1980. Copy available to writer.
  26. The effects of the present population pressure on the ecology of many of the Communal Areas in the Victoria Province in the vicinity of Great Zimbabwe is well known; it must have been considerably worse in the immediate vicinity of Great Zimbabwe. Early photographs of Great Zimbabwe show that there was a considerable amount of cultivation around Great Zimbabwe and the huts of Mugabe's Duma on the hills in the vicinity; see Photographs on display at site Museum, Great Zimbabwe.



27. T.N. Huffman, 'Southern Africa's First Town', see map.
28. Ibid the area from which Brachystegia is absent more or less coincides with Huffman's built-up area.
29. I am grateful to Tom Muller of the National Botanical Gardens, Harare, for information obtained from him in a discussion about the possible vegetation climax and the various species that might be considered pioneers at Great Zimbabwe. Opinions expressed are my own.
30. J. Theodore Bent, The Ruined Cities of Mashonaland, London, Longmans, 1896. The drawing on page 101 shows that Zimbabwe was less well wooded than it is today; protection from grass fires may also have encouraged tree growth since then.
31. Mtetwa R.G.M. 'The "Political" and Economic History of the Duma', pp 184-98.
32. Of course many of the outlying parts of the Zimbabwe Culture predate and are contemporary with Great Zimbabwe. However, the majority of them appear to have outlived Zimbabwe by as much as two centuries; see T.N. Huffman, 'Radio Carbon Dates' 324-5.
33. Letter from H. Wild, Senior Botanist, Research and Specialist Services to Mr. Parry, dated 18th Sept., 1954, published in NADA, No. 32, 1955, p 124.
34. The wild lemon appears to have been introduced in the pre-colonial era in places like the Mazoe Valley, though I am uncertain when it became established around Great Zimbabwe. They are not numerous however. Personal observation.
35. All trees in this list were identified by myself during the period that I lived at Great Zimbabwe (1974-8).
36. These trees have not been seen by the present writer but have been recorded by others; see Anon, 'The Vegetation of the Zimbabwe Area', A Guide to the Zimbabwe Ruins, C.E. Cooke, L.E. Hodges and P.S. Carlake, National Museums, 1971, pp 26-7.
37. Again identified by author.

## LIST OF WOODY VEGETATION FOUND IN THE VICINITY OF GREAT ZIMBABWE

In the past writers on Great Zimbabwe who were mistakenly trying to claim an 'exotic' origin for the structures claimed that there were many non indigenous trees in the vicinity of Great Zimbabwe which were thought to be of Indian origin especially figs. Botanists who examined the flora around Great Zimbabwe, however, pointed out that the flora of the area was completely indigenous and the allegations that there was a non indigenous element in the flora were 'wishful thinking' (33). The only exotic flora around Great Zimbabwe that has escaped cultivation are such species as Jacaranda mimosifolia (Jacaranda), Lantana camara (Cherry Pie) and Citrus limon (Wild Lemon or muremani) which have been introduced during the last eighty or ninety years, though the wild lemon may have been introduced much earlier. (34)

The following is a description of the woody plants within the area around Great Zimbabwe from which Brachystegia and Fulbernardia are absent, the most common being :- (35)

- Acacia karoo (mubayamhondoro or sweet thorn)
- Acacia sieberana (muvunga or umbrella thorn) Indicates possible water logging.
- Acacia schweinfurthii (rukato)
- Albizia amara (mugarahanga)
- Albizia adianthifolia (mucherenje) Indication of reasonably high rainfall
- Albizia versicolor (mubangata or poison pod albizia)
- Aloe excelsa (tree aloe or chikowa)
- Bauhinia galpinii (mun'ando) Indicates reasonably high rainfall
- Bridelia micrantha (garagunguvu) Pioneer — at least in Eastern District.
- Burkea africana (mukarati)
- Celtis africana (murima) Pioneer — at least in Eastern District.
- Combretum molle (mubondo)
- Cussonia kirkii (mufenje)
- Cussonia spicata (mufenje)
- Cussonia natalensis (mufenje)
- Cyathea dregei (chitsamva) Tree Fern. May be slightly outside area. High rainfall.
- Dichrostachys cinerea (mupangara or Chinese Lantern) Overgrazing.
- Dombeya rotundifolia (mutoranundu)
- Erythrina lysistemon (mtiti or Lucky Bean Tree)
- Eucalyptus grandis ? Cultivated.
- Euphorbia ingens (mukonde or Candelabra Tree)
- Ficus capensis (muwonde or Cape Fig)
- Ficus quibeba (mpauwa)
- Ficus species. There are other indigenous figus<sup>sp</sup> especially on the hill ruin which I have not identified.
- Heteropyxis dehniae (mutandavaromba or Lavender Tree)
- Jacaranda mimosifolia. Escaped from cultivation.
- Lonchocarpus capassa (mupandapanda or Rain Tree)
- Mimosa zeyheri (mucheche or Red Milkwood Tree)
- Olea africana (mupfungo or Wild Olive)
- Parinari curatellifolia (muchakata or mbola plum) Indicates possible vleimag and waterlogging.
- Piliostigma thonningii (mutukutu or monkey bread)
- Podranea brycei (gwebwa or Zimbabwe Creeper)
- Pterocarpus angolensis (mubvamaropa or mukwa)
- Pteleopsis sp
- Rauvolfia caffra (mukashu)
- Strychnos pungens (mungono)
- Terminalia serica (mususu, mangwe)

Appendix continued :

Terminalia sp? Not identified.

Trema orientalis (mufeteti or African Elm) Pioneer forest sp. in Eastern District.

Vitex pavos (mudyagava or Chocolate Berry)

Zizuhus mucronata (muchecheni or Buffalo Thorn)

The following species have also been recorded near Great Zimbabwe but not by the present writer:-(36)

Erythrina caffra (murungu)

Brachylaena discolor (mpasa)

Dovyalis tristis (mutjoritito)

Azania garckeana (mutogwe)

Kirkia acuminata (muvumira)

Commiphora sp (mufunufunu)

Teclea swynnertonii

A quick sample of the woody vegetation in the following area around Zimbabwe was taken by me and the following appeared to be the dominant species.

Along the road from the Zimbabwe Ruins Hotel to the main road; Piliostigma thonningii, Ficus sp., Podranea brycei, Dichrostachys cinerea and Acacia sieberana. Along the southern side of the main road from the Zimbabwe Ruins Hotel to the main Zimbabwe turn off (actually just outside the area where Brachystegia and Julbernardia not found); Parinari curatellifolia, Terminalia sp., Acacia karoo, Combretium molle, Strychnos sp., Piliostigma thonningii, Acacia sieberana, Albizia versicolor, Brachystegia speciformis (at top of hill by roadside), Julbernardia globiflora (at the bottom of the hill), Terminalia serica, Pterocarpus angolensis and Jacaranda mimosifolia. On the road that is the main entrance to Great Zimbabwe, Euphorbia ingens, Acacia sieberana, Albozia sp., Heterpyxis dehniae, Ficus sp., Pterocarpus angolensis, Erythrina lysistemon, Rauvolfia caffra, and Bridelia micrantha. In the main ruins and near the Great enclosure, Eucalyptus grandis planted, Heterpyxis dehniae, Acacia sieberana large species, Albizia adianthifolia, Aloe excelsa, Albizia sp., Celtis africana, Euphorbia ingens, Mimusops zeyheri (in the great enclosure), Ziziphus mucronata and Bridelia micrantha (37)

#### GRASSES.

I have not dealt with grasses here. - The grass climax could change very quickly with overgrazing and conversely recover comparatively quickly and the decline of Great Zimbabwe is probably too long ago to have had any effect on the present grass cover.

#### ARABLE AND NON ARABLE LAND TWO TO THREE KILOMETRE RADIUS OF GREAT ZIMBABWE.

Air photos of the Great Zimbabwe environs reveal that roughly about seventy percent of the land immediately around Great Zimbabwe is non arable by today's standards. However, much of this land could probably have been cultivated in small patches with hoes. To the north of Great Zimbabwe towards the Shagashe valley there are larger amounts of potential arable land and the topography of the land is less severe. Much of this area has now been flooded by Kyle Dam.



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